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REMARKS

Amendments to claims 1 and 10 are for the purpose of clarifying what Applicants regard as the invention. No new matter has been added.

I. CLAIM OBJECTIONS

Claims 1 and 10 stand objected to for lacking antecedent basis with respect to the limitation "the at least one marker." These claims have been amended to remove the deficiency pointed out by the Examiner.

II. CLAIM REJECTIONS UNDER 35 U.S.C. § 112

Claims 22 and 23 stand rejected under 35 U.S.C. § 112 as allegedly being unclear. These claims have been canceled without prejudice, rendering the § 112 rejection moot.

III. CLAIM REJECTIONS UNDER 35 U.S.C. § 102

Claims 1-5, 7, 9, 10, 12-15, and 17-19 stand rejected under 35 U.S.C. 102(e) as allegedly being anticipated by U.S. Patent No. 6,307,914 (Kunieda). Applicants respectfully note that in order to sustain a rejection under §102, each element in the rejected claim must be found, either expressly or inherently, in the cited reference.

Claims 1 and 10

Claim 1 and 10 recite establishing a relationship of at least one marker relative to the target by determining a relative position between the at least one marker and the target, and adjusting a radiation beam in response to a tracking signal generated using an image signal of the at least one

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marker. Kunieda does not disclose or suggest the combination of the above limitations. According to the Office Action, column 12, lines 24-42 and column 3, lines 14-37 allegedly disclose the above limitations. However, Applicants respectfully note that column 12, lines 24-42, and column 3, lines 14-37 disclose two different embodiments, each of which does not disclose or suggest the combination of the above limitations (i.e., it is improper to combine different elements from different embodiments in the reference: "The elements must be arranged as required by the claim." MPEP § 2131). In particular, column 12, lines 24-42 discloses positioning a patient based on a landmark 41, and therefore, does not disclose or suggest *adjusting a radiation beam* based on a relative position between a marker and a target. On the other hand, column 3, lines 14-17 discloses a different embodiment in which a tumor marker is implanted inside the tumor, and therefore in fact teaches away from determining a relative position between a marker and a target (see also column 6, lines 58-59, and figure 1 which describe the "tumor marker" 17 as being "buried into a tumor" 18). For at least the foregoing reasons, claims 1 and 10, and their respective dependent claims, are believed allowable over Kunieda.

In addition, according to the Office Action, figure 9A allegedly shows a side view where the tumor marker is not exactly at the tumor position. However, Applicants respectfully note that figure 9A does not show the tumor, and it is understood from the description of the reference as a whole that the "tumor marker" is buried inside a tumor (not shown). As such, to the extent that the Examiner analogizes the "tumor marker" in figure 9A as the claimed marker, figure 9A does not disclose or suggest the above limitation. Furthermore, according to the Office Action, column 3, lines 14-17 allegedly discloses placing the tumor marker nearby the tumor because the passage states that the tumor marker is "placed in the vicinity of the tumor." However, Applicant respectfully

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submit that the term “vicinity” clearly means “locality” or “area”, and that the cited passage clearly describes placing the tumor marker in the locality/area of the tumor, i.e., in the tumor, (as is further evidenced by figure 1; see also column 8, lines 7-10, and figure 2, which describe a tumor marker 17 buried inside a tumor 18 as being “buried in the vicinity of the tumor.”).

Claim 12

Claim 12 recites a control module coupled to a radiation source and generating a control signal to switching off said radiation source in conjunction with generating a beam adjustment signal. Kunieda does not disclose or suggest such limitation. According to the Office Action, column 9, lines 20-28 and column 12, lines 47-63 allegedly disclose the above limitation. However, these passages (describing “embodiment 1” - see column 6, line 45) disclose turning a radiation beam on or off, and does not disclose or suggest doing so in conjunction with generating a beam adjustment signal, as recited in claim 12. Notably, column 16, lines 25-37 (describing “embodiment 7”) discloses adjusting a beam in lieu of turning the beam on/off (as in the embodiment 1). As such, Kunieda does not disclose or suggest, but in fact teaches away, from the above limitation. For at least the foregoing reason, claim 12 and its dependent claims are believed allowable over Kunieda.

IV. CLAIM REJECTIONS UNDER 35 U.S.C. § 103

Claim 34

Claims 34, 40, and 41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kunieda in view of U.S. Patent No. 5,427,097 (Depp).

Claim 34 recites generating a tracking signal in response to an image signal of an anatomy marker. Applicants agree with the Examiner that Kunieda does not disclose or suggest use of an

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internal anatomy as a marker, much less, using an internal anatomy marker to generate a tracking signal. However, Depp fails to make up the deficiency present in Kunieda. According to the Office Action, column 1, lines 50-65 of Depp allegedly discloses use of an anatomy as marker. Notably, the cited passage of Depp discloses use of a marker to assist in aiming of a radiation beam, and does not disclose or suggest using an anatomy marker to generate a tracking signal (e.g., to track a movement of a target). Also, because Kunieda specifically teaches use of artificial markers, it would be inappropriate to drastically modify the teaching of Kunieda by eliminating the use of markers. For at least the foregoing reason, claim 34 and its dependent claims are believed allowable over Kunieda, Depp, and their combination.

Claim 37

Claims 37-39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,385,288 (Kanematsu) in view of Depp.

Claim 37 recites collecting a plurality of images at a plurality of phases in a same physiological cycle, said plurality of images providing an indication of a location of the target relative to an internal marker, creating a treatment plan based at least in part on the plurality of images collected at the plurality of phases in the cycle, and delivering a radiation beam to the animal body according to said treatment plan. Applicants agree with the Examiner that Kanematsu does not disclose or suggest that the images provide an indication of a location of the target relative to an internal marker. According to the Office Action, column 1, lines 50-65 of Depp allegedly discloses using an implanted markers, and therefore, Kanematsu may be modified to include use of an implanted marker. However, Kanematsu specifically teaches determining the location of target directly for purposes of patient positioning without using a marker (see for example, column 6, lines

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56-66, and column 7, lines 10-25, which describe processing images of "affected part" 2 of a patient for positioning a patient and verifying position of the affected part), and therefore, it would be inappropriate to drastically modify the teaching of Kanematsu to include use of markers. In addition, Applicants note that Kanematsu is operable independent of Depp, and that there is nothing in Kanematsu that discloses or suggests that a marker is needed to perform the teaching of Kanematsu. For at least the foregoing reasons, Applicants respectfully submit that the alleged combination of Kanematsu and Depp is impermissible hindsight, and request that the § 103 rejection be withdrawn with respect to claim 37 and its dependent claims.

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CONCLUSION


Based on the foregoing, all remaining claims are believed in condition for allowance. If the Examiner has any questions or comments regarding this amendment, please contact the undersigned at the number listed below.

The Commissioner is authorized to charge any fees due in connection with the filing of this document to Bingham McCutchen's Deposit Account No. 50-2518, referencing billing number 7012072001. The Commissioner is authorized to credit any overpayment or to charge any underpayment to Bingham McCutchen's Deposit Account No. 50-2518, referencing billing number 7012072001.

Respectfully submitted,

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Dated: April 19, 2006

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